The Theory of Multiple Intelligences Implemented in the Elementary Classroom

An Honors Thesis (Honors 499)

by

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April 28, 1997

May 10, 1997

Purpose of Thesis:

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Howard Gardner's theory of Multiple Intelligences is discussed in relation to teaching in the elementary classroom. The seven intelligences are defined and characterized as they would be seen in the primary grades. Topics of discussion include multicultural education and the theory of multiple intelligences, strategies to implement multiple intelligences education in the classroom, and personal experiences with the integration of multiple intelligences in an elementary classroom. Issues of concerns with multiple intelligences education are also discussed and a resource guide for teachers is included.

Introduction and Statement of Purpose

The purpose of this thesis is to inform teachers of the principles of Howard Gardner's theory of multiple intelligences (MI), define and characterize the seven intelligences, and show the theory's purpose in elementary education. I will also show MI and multicultural education can be linked together to accommodate every student and every intelligence. Examples of ways in which a teacher may implement Multiple Intelligence education in the classroom, ranging from thematic units to individual lessons centers will also be explored.

I hope that educators will find this to be a useful resource. My experiences at the 1996 Multiple Intelligences Conference held at New City School in St. Louis, my research in this area, and my personal experiences with using MI as an integrated part of the classroom have by no means made me an expert. But, it has made me realize that multiple intelligences theory, if implemented correctly, can be a very successful teaching tool. It motivates students, builds on their strengths, actively involves them in their education, and encourages divergent thinking. Most of all, it gives learners many different paths for learning; creating a higher likelihood for success.

What is an Intelligence?

When we say "She is very intelligent" or "He answered that question intelligently" what do we really mean? Human beings are constantly trying to define and assess intelligence. Webster's Dictionary defines intelligence as "the ability to perceive logical relationships and use one's knowledge to solve problems." But deciding through which medium the relationships will be discerned and in which way the problems will be presented has long been up for debate.

Traditionally, intelligence is defined as the ability to answer items on tests of intelligence (Gardner 1993). The results of these tests are supported by statistics that compare responses of subjects of different ages. This gives the impression that intelligence does not change much with age, training, or experience. By this standard, intelligence can be seen as an inborn attribute of the individual (Gardner 1993).

Standardized intelligence and achievement tests fall under this definition intelligence. They use a very narrow range of tools, usually questions related to linguistics and logic, to decide if a person is below, comparable, or above the level of his/her peers. Gardner points out in his 1993 book Multiple Intelligences: The Theory in Practice that linguistic and logical skills form the core of most diagnostic tests of intelligence that are used in our schools.

Howard Gardner challenged our accepted standard for defining intelligence in Frames of Mind (1983). In this book, hundreds of empirical studies were reviewed. Based on these studies, the seven intelligences were identified. These are the linguistic, logical-mathematical, bodily-kinesthetic, musical, spatial, intrapersonal, and interpersonal intelligences. Because theories based on emperical evidence are constantly subject to new findings, there is room for the concepts to be reviewed and changed. Such is the case with MI, which is "constantly being reconceptualized in

terms of new findings from the laboratory and from the field" (Gardner, 1993, 204).

The theory of multiple intelligences holds that intelligence is the ability to solve problems or fashion products, in a variety of ways, that are of value to a particular culture or community (Gardner 1993). An intelligence must also contain the potential for finding or creating problems so that new knowledge may be acquired (Gardner 1983).

Gardner lists a set of criteria to which all intellligences must adhere. In both Frames of Mind (1983) and Multiple Intelligences (1993), Gardner lists these criteria and explains why they are imperative in the profiling of an intelligence. The criteria include:

- **Potential isolation by brain damage**
  When brain damage occurs often one area of intelligence, such as linguistic, may be destroyed, while another, such as musical, may remain fully intact. Hence, the person may not be able to speak at all, but will have complete ability to play difficult musical pieces.

- **The existence of idiot savants, prodigies, and other exceptional individuals.**
  Theses people often have one area of human competence that is very advanced, while others may be extremely underdeveloped. Gardner states that "... the existence of these populations allows us to observe the human intelligence in relative- even splendid- isolation".

- **An identifiable core operation or set of operations**
  Certain kinds of internally or externally presented information can act as a catalyst for information processing operations. In order for an intelligence to exist, one or more basic information processing mechanisms must be in place. A catalyst for the set of core operations for the logical mathematical intelligence might be a pattern of numbers in a problem.

- **A distinctive developmental history, along with a definable set of expert end-state performances**
  It should be possible to identify levels of expertise in the development of an intelligence, ranging from the universal beginnings to high levels of competence". This means that for every intelligence there are distinct markers that identify when the learner has reached a new level or state of performance.

- **An evolutionary history and evolutionary plausibility**
  Because all species exhibit intelligence, it is important to document the evolution of an intelligence throughout history. The beginnings of our current intelligences date back millions of years in the history of different species. An example of this is the evolutionary history of musical intelligence. Birds sing and this musical intelligence is shared with humans.

  (Gardner, 1983, 60-65)

With the prerequisite and criteria for an intelligence determined, Gardner has established that there are, in fact, seven different intelligences. Each of these has it's own system of symbols which may vary from culture to culture. An intelligence must also be expressed through a system

of symbols. These symbols would have a culturally contrived system of meaning, which captures and communicates vital forms of information (Gardner 1993). For example, in our culture the symbol system for the linguistic intelligence is the English alphabet. Likewise, musical notation or rhythmic patterns are the symbol system for the musical intelligence. Because the symbol systems are used within the context of the culture, they allow for the creation of a cultural product, whether it be absorbing and transmitting knowledge, or expressing an opinion or emotion.

When Gardner first developed the theory of multiple intelligences, he made no attempt to transfer his theory into an educational plan. In his 1983 book Frames of Mind he states that:

> "MI theory is in no way an educational prescription. There is always a gulf between psychological claims about how the mind works and educational practices, and such a gulf is especially apparent in a theory that was developed without specific educational goals in mind. Thus, in educational discussions, I have always taken the position that educators are in the best position to determine the uses to which MI theory can and should be put" (276).

He also addresses the topic of intelligence from an objective point of view:

> "...MI theory makes no claims whatsoever to deal with issues beyond the intellect. MI theory is not, and does not pretend to be, about personality, will, morality, attention, motivation, and other psychological constructs. Note as well that MI theory is not connected to any set of morals or values. An intelligence can be put to an ethical or an antisocial use" (274)

The seven intelligences laid out in Frames of Mind adhere to the definition of intelligence and meet all required criteria for being an intelligence. However, intelligences are often confused with learning styles or domains because of the broad spectrum of elements that they cover. Gardner clarifies the differences between intelligences and learning styles or domains in an article in the November 1995 issue of *Phi Delta Kappan*:

"Any cultural activity in which individuals participate on more that a casual basis, and in which degrees of expertise can be identified and nurtured, should be considered a domain. Thus physics, chess, gardening, and rap music are all domains in Western culture. Any domain can be realized through the use of several intelligences; thus the domain of musical performance involves bodily-kinesthetic and personal as well as musical intelligences. By the same token, a particular intelligence, like spatial intelligence, can be put to work in a myriad of domains, ranging from sculpture to sailing to neuroanatomical investigations."

When discussing learning styles he relates that an individual may be said to have a reflective style, but this may not be true for all areas. He/she may be reflective in his/her writing, but have no sense of reflection whatsoever in his/her logical problem solving areas. Or the person may be intuitive when working with spatial problems, but have no intuitions at all when dealing with people on a personal level (Gardner 1995). "There is little authority for assuming that an individual who evinces a style in one milieu or with one content will necessarily do so with other diverse contents - and even less authority for equating styles with intelligences" (Gardner 1995).

The Seven Intelligences

In Frames of Mind (1983), Gardner identifies the seven intelligences of human beings. Each intelligence meets the criteria that he set forth and works under a set of core operations. Each intelligence can also operate in isolation, as can be seen in the cases of prodigies, or in that of idiot savants. However they overlap to function together more often than not. Except for abnormal individuals, intelligences always work together, and almost all adult roles in society will involve the use of several of them in concert (Gardner 1993).

Thus, in defining and characterizing the seven intelligences, we must remember that each one can and is used to explore and utilize extensions of the others.

For example, while solving a mathematical equation a student may talk themselves through it linguistic) or draw a diagram to help them lay out complex relationships (spatial). While the initial intelligence being used to solve the problem is logical, the student has integrated other intelligences to broaden his/her scope of the situation.

The seven intelligences defined by the information presented in Frames of Mind (1983) are:

- **Interpersonal Intelligence** utilizes intuition and perceptions about others to identify, assess, and respond to the moods, temperaments, motivations and desires of others.
- **Intrapersonal Intelligence** accesses one's own range of emotions, make discriminations among these emotions, and label them. This understanding can then be used a tool for guiding personal behavior.
- **Linguistic Intelligence** involves using words and language in different forms to create a culturally significant form of communication or expression.
- **Logical-Mathematical Intelligence** is the ability to locate patterns and apply logic to problem solving situations.
- **Musical Intelligence** requires sensitivity to non-verbal sounds in the environment. Pitch (or melody), rhythm, auditory sense, and auditory realization are all crucial to all musical participation.
- **Spatial Intelligence** is the ability to maneuver and operate a mental model of an object or space. Often these models are in the form of pictures or images such as shapes.

- **Bodily-Kinesthetic Intelligence** us using the body as a problem solving tool or instrument of communication.

The Seven Intelligences Characterized

Interpersonal Intelligence:

Because much of our lives are spent interacting with others, it is imperative for children to develop strong interpersonal intelligences. If we are successful in building solid relationships with other human beings we will most likely be successful in life. Elementary school is the perfect setting for the growth of interpersonal intelligence. It is there that most children learn the social skills that they will carry with them for the rest of their lives. Tolerance, empathy and understanding of the perspectives, desires, and needs of others are all developed for the most part, in the elementary years. When children reach adolescence and adulthood the "probability of significant changes regarding flexibility, cooperation and socialization greatly decreases." (Faculty of New City School, 7)

Typical skills that are addressed in quest for greater interpersonal intelligence include demonstrating the ability to compromise, cooperate, and behave responsibly in group situations with both adults and peers. Understanding and appreciating the perspectives of others, including those with different cultural backgrounds should also be an objective. Finally, students should be able to express their feelings while giving constructive and appropriate feedback to others.

Intrapersonal Intelligence:

Intrapersonal intelligence allows children to gain a sense of themselves. Knowing what they like and dislike, as well as their areas of talent and inability, helps to determine the activities that they will engage in. It also leads to success when working with others in that they are better

able to capitalize their strengths and downplay their weaknesses. Intrapersonal intelligence allows for success because students learn how to reflect, evaluate, and improve their behavior when working alone or with others.

Activities in the area of intrapersonal intelligence revolve around the child's ability to know themselves. Journal entries help students to focus on their feelings. Reflection sheets allow them to see what intelligences they are using to solve problems in different situations. Students also gain a sense of identity through activities in the interpersonal intelligence. They see that they are individuals with special talents. The focus on using personal strengths to compensate for weaknesses in problem solving builds self-esteem. Students with a knowledge of how they are motivated will also be better able to use this to push themselves toward their set goals.

Linguistic Intelligence:

Linguistic intelligence is crucial for the academic, social, and personal development of a child. It is of high cultural value in our society as well. The use of language in written or verbal form enables communication to occur. Linguistic intelligence has been widely used throughout the history of the educational system in the form of lecturing, reading, speaking and writing. It is also one of the easiest intelligences to incorporate into an MI program because of its value in the traditional classroom.

Linguistic intelligence exists in the elementary classroom as reading, writing, listening, and speaking. These are the components of most language arts programs today. Creative uses include debating, writing poetry, publishing student-created books, and listening to the written work of others. Students with a high linguistic intelligence are generally good readers, enjoy using language in new ways, and are likely to have above average written communication skills.

Logical-Mathematical Intelligence:

The logical-mathematical intelligence is also one that has been an important part of the traditional curriculum. However, logical-mathematical skills transcend arithmetic skills. Reasoning, developing patterns and relationships, and using numbers as tools to solve problems are all domains of the logical-mathematical intelligence. Science also relies heavily on this intelligence because of its use of logic and method to form hypothesis and solve problems.

Activities in the elementary school classroom that directly relate to the logical-mathematical intelligence are not limited to the subjects of Math and Science. Students who demonstrate capabilities in the logical-mathematical intelligence are likely to transfer the use of logic to other subjects. They may show an interest in how things work, notice patterns and relationships in the spelling of words, design a game format, create patterns in rhythm, or recognize math concepts outside the math context.

Musical Intelligence:

Musical intelligence is the earliest to emerge (Gardner 1983). Musical intelligence is one of great value in our culture. We admire skilled musicians and singers. Advertisements use it to sell products and influence our opinions. Music is all around us everyday in many different forms. We incorporate it into our daily activities and use it as a tool for relaxation. Yet in our schools, we separate the subject and make it of lesser value than the content of the classroom. It is not often seen for the significant cultural marker that it is.

In an MI classroom, musical intelligence is taken seriously. Music is integrated into all parts of the curriculum. Musical intelligence is seen as a valuable asset to a person's identity. The composition of music, the playing of instruments, and the singing of songs all become a major part of the daily activities in an MI-driven classroom.

Children with musical intelligence may demonstrate their abilities in many different ways. They may perform compositions written by themselves or fellow students. They might use music as a problem solving tool in the context of another subject area. Generally, they will easily memorize information that is presented in the form of a song. They also might mimic sounds or rhythms in the environment with great dexterity.

Spatial Intelligence:

Spatial intelligence is one of the least used intelligences in the traditional classroom, yet it has many real-world applications. Architects, artists, engineers, and navigators all use spatial intelligence in their work. The ability to accurately perceive stimuli in the environment and then interpret this perception into a useful context characterizes spatial intelligence. "The spatial domain involves the ability to transfer internal and external images and to duplicate, manipulate, create and recreate them through concrete modalities" (Faculty of the New City School, 191).

In the elementary classroom, spatial intelligence may be developed using maps, three-dimensional models, and the display of artwork. Visual images are not enough to completely develop the spatial intelligence. Students must learn to internalize what they see so that they can create an image in their mind. Blind students are often very spatially intelligent. They are able to gain a sense of their surroundings through tactile measures and then use this information to create an image of their environment in their mind.

Students with a tendency toward spatial intelligence often exhibit talent in diverse areas. They may be able to accurately read a map in Social Studies or build a machine for Science. In Math, they might draw diagrams to help them understand a particular problem or show great interest in the use of tactile manipulatives. Generally, students with high spatial intelligence enjoy creating art that shows texture, space, and shape.

They might also be especially talented at taking toys apart and then putting them back together.

Bodily-Kinesthetic Intelligence:

The bodily-kinesthetic intelligence is also one that has often been overlooked as a window to instruction in the traditional classroom. Typically, students are encouraged to "be still" during learning activities. The general exception to this rule was in the course of physical education. However, gym class mainly focused on developing athletic ability in students and left much of the bodily-kinesthetic intelligence untapped.

Students with bodily-kinesthetic intelligence use their bodies as tools for exploring and interpreting the world around them. They might trace over letters of a word to better understand the way it is spelled or use gestures and body language to communicate an idea or opinion to others. Usually students with this intelligence have good eye/hand coordination, balance, and highly developed motor skills.

Activities in the realm of the bodily-kinesthetic intelligence include drama, creative movement, games that involve physical participation, and tactile manipulatives. By using physical activities to teach or reinforce lessons in the classroom, teachers are better able to focus the attention of students who have high levels of bodily-kinesthetic intelligence. At the same time, they are communicating to the student a value for the process of learning through movement.

Each of the seven intelligences works with the others depending on the situation and the child. It is almost impossible to separate them or to classify students as learning only through one intelligence. The teacher must examine the combination of intelligences that each child holds, and then developing appropriate learning activities that correspond. This way, value is given to all of the intelligences that the students use, and to the students themselves.

Concerns and Myths about MI

The theory of Multiple Intelligences does not seek to become the next panacea for the problems of today's educational system. It does seek to change the way educators view and value intelligence within individual students. Instead of ignoring individual intelligences educators should instead try to ensure that every student receives an education that maximizes his or her own intellectual potential (Gardner 1993).

One of the main concerns with MI theory implementation in the classroom is that students will not gain as many skills in the area of English and Mathematics as they might in a more traditional classroom setting (Armstrong 1992). They argue that tests such as the ACT and SAT are based only on verbal and logical skill and thus, curriculum should revolve around the skills that will be the most helpful on these tests. The rationale is that because standardized tests are the measures that our society puts on intelligences, classroom curriculum should also conform to these standards.

The theory of multiple intelligences does not seek to diminish linguistic or logical-mathematical intelligences in our culture. However, it does recognize that society is comprised of individuals who must demonstrate a wide range of intelligences in their careers and everyday lives. It is our duty as teachers to prepare the next generation of workers, leaders, and citizens for their roles as productive members of society. Occupations in society do not use training methods which exclusively deal with verbal or logical intelligence. Society is able to fill its many roles and niches more effectively because people demonstrate different profiles of intelligences (Gardner 1993). MI education in the elementary classroom prepares children for this by using meaningful activities that are comparative to those an adult might have to perform.

This way, all students will learn the same material in each subject, but each will do so in the way that best meets the needs of his or her intelligences.

Another concern is that MI education will pigeon hole students according to factors outside of their intelligences. For example, students of color will be seen as strong in bodily-kinesthetic or musical, girls will be viewed as highly linguistic, boys will be considered to have strengths in the logical-mathematical intelligence. Because educators are working hard to get away from stereotypes and generalizations about their students, this is a valid concern. However, it is the complete antithesis of the goal for MI education.

The theory of multiple intelligences supports the anti-bias model of multicultural education, it defies stereotypes based on gender, race, religion, or any other characteristic that is external in nature. But, the activities in an MI-driven classroom offer all students greater opportunities for self-understanding (The Faculty of the New City School 1994). This self-understanding allows students to see themselves as individual human beings. Their identities come not only from their culture, but also from the ways in which they express their intelligence.

Educators are also worried that the implementation of MI education will cause problems in the area of assessment. Our educational system is very concerned with testing students to ensure that they have retained the information they have been taught. The feeling is that because seven intelligences have been identified, there will be a need to "create seven tests and secure seven scores" (Gardner 1995).

In any learning situation assessment needs to occur. It is a tool for measuring the development of students intellectually and crucial for teachers who use feedback to guide their teaching strategies. Authentic assessment is assessment that measures the material and skills taught within the context of the way in which it was taught (Armstrong 1993). This form of

assessment is imperative for students who are learning through MI driven instruction. "It is crucial that intelligences be assessed in ways that are 'intelligent-fair', that is in laboratory and from the field" (Gardner 1995). This means that the context of the problem to be solved for assessment should be solved using the materials of that intelligence. It is not fair for a child's musical intelligence to be assessed through the lense of a linguistic or logical intelligence if no prior connections to these have been made.

There are still many unanswered questions concerning the implementation of MI into a classroom setting. Because the theory allows for flexibility in the way it is introduced and the extent to which it is used, virtually any fear concerning negative affects can be assuaged.

Multicultural Education Supported by Multiple Intelligences Education

Multicultural education is a hot topic among educators today. With the diversity of students increasing at a rapid rate, the educational system needs to find methods that allow for the integration of a curriculum and materials that lend themselves to diverse populations of students. Howard Gardner's theory of Multiple Intelligences can do just that. By concentrating on each child's combination of intelligences, and then using these as a window through which they can learn, teachers who implement MI theory are creating a personal identity for each student, while teaching the others to celebrate differences in individuals. In fact, teachers who are using MI techniques have reported a growing acceptance of diversity among their students (Nuzzi 1996).

MI seeks to redefine multicultural education. The traditional model of multicultural education views the child as the product of culture in that the child's set of experiences and his or her outlook are totally predetermined by his or her culture (Wardle 1996).

Think of how boring our society would be if there were no differences in the ways in which people express their talents. There would be no Albert Einstein (logical-mathematical), Beethoven (musical), Mother Teresa (interpersonal), Virginia Wolfe (linguistic and intrapersonal), Michael Jordan (bodily-kinesthetic), or Picasso (spatial). People who have great strength in one intelligence need the opportunity to develop it to the fullest. If we, in our educational system, seek only to enrich the verbal-linguistic and logical mathematical intelligences, we are doing a great injustice to our culture, not to mention the children who might have many untapped talents. As Howard Gardner wrote in his 1993 book Multiple Intelligences, "...cultures profit from these differences in intellectual proclivities found within their populations" (33).

One criticism of MI based education is that it puts too much emphasis on individualized education. Teachers will spend too much time preparing individualized lessons for students and not enough material will be covered. Because a huge time constraint is already placed on teachers, to ask them to make separate lessons for each student in each intelligence would hinder the pace of learning in the classroom.

Proponents of the theory argue that individualized education is the trend of the future. With more and more diversity among students, both culturally and intellectually, it only makes sense that the curriculum and teaching methods reflect this variety. Howard Gardner (1993) points out that "... scientific evidence indicates that we should as a polity move in the direction of individual-centered schooling" (68).

Lessons using the theory of multiple intelligences do no necessarily have to be taught separately to different students. In fact, many are based on group work and cooperative learning. Because all people have certain core abilities in each of the intelligences (Gardner 1983), the curriculum can be designed to accommodate most, if not all of these in each subject area.

This would mean that all African-American children have had the same experiences, like the same things, and share the same outlook on their life. Realistically, this is impossible. Each child comes to school with an individual set of experiences, tastes, and viewpoints. Some of these factors may be predetermined by culture, but others are simply left to personality differences among individuals.

There are many disadvantages to the traditional model of multicultural education. The perpetuation of stereotypes is among them. Often, the traditional approach to multicultural education views that all people in a culture are the same because they share certain common traits and experiences. The traditional model does not allow for the tremendous diversity to be found within today's traditional cultural groups (Wardle 1996). It also does little to build a solid base of individual self-esteem in the child. In this model, individual identity and self esteem are based on a sense of belonging to one's cultural group (Wardle 1996).

In this approach, the focus is on the culture rather than the individual. This may lead to disagreements about which culture is better or most important. The individualization of people within the culture is taken out of focus and children may feel as if they must conform to the generalizations of their cultures, rather than celebrate the identity that is entirely their own. Instead, the focus should be placed in recognizing the unique set of experiences each child brings to school, and learning how those experiences can be used to help him or her achieve self-esteem and academic success (Wardle 1996).

Another model of multicultural education lends itself much more easily to the integration of MI instruction. This is the anti-bias model. The purpose of this model is to teach all children to accept each other through a multicultural foundation. It enables each child to associate positive feelings with multicultural experiences and to feel included and valued (Dimidjian 1989).

The anti-bias model puts the focus on the child rather than on the culture. Because many factors, not just culture, play a key role in the development of the individual, the emphasis is on the contexts which affect the child's experiences and point of view. "The individual child exists within his/her own dynamic context, or milieu, which includes a variety of experiences that interact with each other to produce a unique environment" (Dimidjian, 1989, 48).

The realm of culture may include many of the following: family traditions, religion, holidays, heroes, music, ideals and beliefs, primary language, and national origin (McCracken 1993). Because culture encompasses such a wide range of elements, to say that one culture is the same for everyone is absurd. Culture may vary from city to city, family to family, and even person to person. Teachers need to remember that each child brings to school not only the influence of his/her culture, but also his/her own personal experiences. The anti-bias model for multicultural education allows for the individual differences in children and focuses on the experiences that a culture may offer a child. In this way, children learn to appreciate cultures other than their own without using the traditional approach which often leads to stereotyping.

This is not to say that learning about one's own culture or the cultures of others is unimportant. It is crucial for children to compare and contrast other cultures with their own so that they gain a sense of global community and are better able to accept differences among people. Multiple intelligences teaching can be used effectively in the traditional model of multicultural education. Multicultural situations are a perfect context for MI instruction because various elements of culture such as literature, art, music, dance, architecture, and poetry, can be used to teach the material being studied (Nuzzi 1996).

Because each culture is different, the members utilize the seven intelligences in different ways. A person living in a culture where navigation of the sea is imperative for survival will

probably place a higher value on spatial intelligence than a person who lives in a culture where there is little use for such skills. Likewise, children who are expected to learn traditional dances and songs to become functioning members of a society will appreciate musical intelligence more than a child who is not exposed to such traditions. In his book Multiple Intelligences: The Theory in Practice (1993), Howard Gardner states that "...the extent to which the talent is expressed publicly will depend upon the milieu in which one lives" (100).

MI can also be very effective in supporting the more individualized anti-bias model. Individualized multicultural programs can be designed for each student by learning about the student and his or her family's educational expectations. It also discourages stereotyping and prevents expectations that children who belong to the same cultural groups will all behave in the same way. Students learn that each culture contains many different kinds of people within it.

In addition to developing their own cultural identity, it is important that students see the ways in which all cultures use and value the seven intelligences. When looking at the ways in which cultures value intelligences, it is clear that most of these forms do not correspond with our traditional mode of intelligence testing. Repeating random numbers in sequence is a task that is often seen on traditional intelligence tests. However, Howard Gardner's definition of intelligence does not associate the success of this exercise with a level of intelligence because it has little cultural value. We do not see examples of a culture where the elders pass on random digits to the next generation. Instead, music, language, art, social norms, political institutes, and scientific accomplishments are the elements that give a culture its identity. These are what will be passed on to future generations.

The theory of multiple intelligences can also be used to demonstrate the influences that cultures have on one another. Every culture has produced individuals with high abilities in a

certain intelligence and these individuals have made great contributions to the global community. For example, by examining the work of Frida Kahlo, a Mexican artist, and Jim Thorpe, a Native American athlete, students will see that different cultures can produce all sorts of people who express their intelligences in ways that are valued within the culture. Influences of these accomplishments can be seen in the products of other cultures. Students can then compare this work to the ways in which people of their own culture value that intelligence. Through learning about many different people of many different cultures who demonstrate all seven intelligences, students will be less likely to stereotype a culture as valuing only one intelligence.

Thus, multicultural education and the theory of multiple intelligences complement each other in an educational system that is becoming more and more diverse. Because the theory of multiple intelligences supports the anti-bias model of multicultural education, students will be seen as individuals who have many intelligences that are influenced not only by their culture, but also their personal experiences. In learning about the ways in which other cultures may value or demonstrate an intelligence and then recognizing its influence on their own cultural, children will gain an appriciation for diversity.

My Experiences with Multiple Intelligences

I became interested in Howard Gardner's theory in one of my educational psychology classes. Later, when I learned that my supervising teacher also had interest in MI education, I decided to do some research so that I might incorporate the principles of the theory into some of my lessons. When I was offered a chance to attend a conference on MI where Howard Gardner was to be the keynote speaker, I jumped at the opportunity. The conference was to be held at the New City School in St. Louis.

The New City School is located in an urban area and is founded on the idea that children should have the opportunity to learn together with other children of diverse racial, socioeconomic, and academic backgrounds (Faculty of the New City School, 1994). It promotes learning that is experientially based and uses academic, aesthetic, and physical education in the curriculum to promote individual differences among the students. Because it supports the integration of new ideas into the classroom, it was a perfect candidate for MI theory to be put into practice.

The school stayed in session during the conference so that educators could see MI in practice in each of the classrooms. The children are first introduced to the idea of the seven intelligences at the pre-school level. They are encouraged to explore the world around them using all of their senses and various manipulatives, such as musical instruments, measuring instruments, and art materials that lend themselves to the development of the intelligences. They participate in group and individual activities such as role playing and personal thought time, where the interpersonal and intrapersonal intelligences can be investigated.

In the primary grades basic subjects such as reading, mathematics, and science are taught in ways that allow for children to learn through one or more of the intelligences, often in a nontraditional way. For example, a lesson on addition may involve children reading a story and composing their own problems (verbal-linguistic), then the children may have to act out the problem (bodily-kinesthetic) and then discuss their strategy with others to see if there are other ways of solving it (interpersonal). There is also an emphasis on working with others and learning to respect individual differences (interpersonal) while reflecting on their own identity (intrapersonal).

During the conference there were several performances given by the children to demonstrate their development in the different intelligences. These included a piano piece that was

played by a fourth grade boy, a poem with choreographed movement that was read that celebrated the talents of all children, and the singing of several songs about the diversity of human beings. All performances and costumes were produced and created by the students of New City School. It was truly an amazing site to see these children put their talents to use in such a creative way.

Although every school contains children who would greatly benefit from the implementation of MI theory in the classroom, not all schools have the resources available to create a curriculum like that of The New City School. This was the case at Washington Carver Elementary School where I completed my student teaching. The school had a traditional curriculum, but encouraged teachers to integrate new techniques and methods into instruction in order to motivate as many students as possible. After attending the MI conference, I applied the methods I had observed and learned about into my daily classroom activities.

I began by introducing the theory of MI to the students through a story that Bruce Campbell used in his workshop and book. I then explained to the children that because each of us is different, we all are intelligent in many different ways. We discussed what we thought our intelligences might be and then thought of ways that we could use them to learn.

After introducing the theory, I created a learning center for language arts based upon MI. It had seven different activities, each relating to a different intelligence. The children chose an activity, and then completed a project contract. I wanted to expand their intrapersonal intelligence by making them reflect on the reasons they had for choosing the particular project. As I guided them through their projects, I had a chance to see MI theory at work. These students, who at one time had to be dragged through workbook exercises and comprehension questions, were now eager to finish the story and begin work on their projects. It was as if their brains had been shifted

into high gear. After they finished the projects they presented them to the class and explained why they enjoyed using that particular intelligence as an avenue for learning. I also had them evaluate their projects and communicate their opinions on the MI learning center.

The response was very positive. The students were eager to use the learning center again, but this time, they wanted to explore activities that they had seen their classmates try. They now understood that there are different ways in which people are intelligent. One student, who was a very poor reader with low comprehension and sequencing abilities, was able to use his musical intelligence to write a song detailing the events of the story. His classmates were impressed, to say the least, when he sang it to them. I was impressed when he was able to relate the events of the story to me in sequence in a discussion *after* he gave his performance.

This project did consume more time than is usually allotted for a story in a basal reader, and I spent much of my time guiding students through the process of completing their projects. However, the results that were achieved made me realize that even if I cannot have a total MI classroom, I will be able to integrate activities that rely on students' different intelligences into daily activities with successful results that lead to motivation and learning.

The learning center was not the only activity where I tried to implement MI theory. I integrated activities that involved different intelligences in every subject that I taught. In Spelling, I would often have the children organize the words by spelling patterns (logical-mathematical) or pantomime the definitions of the words for other students (bodily-kinesthetic). I found that Social Studies lends itself very easily to the integration of MI theory. The lessons that I used ranged from journal writing (intrapersonal) to map construction (spatial).

The children also enjoyed group projects and presentations that allowed them to develop their interpersonal intelligences while using others such as logical-mathematical, linguistic, spatial, and bodily-kinesthetic to solve problems or create products.

I plan to implement Howard Gardner's theory of Multiple Intelligences to the fullest extent in my own classroom. Thematic units, simulations, learning centers, and individual lesson plans will be used in accordance with my district curriculum and individual school policy. I hope to allow my students to further develop their strengths while building a solid foundation in areas of intelligence that they might be reluctant to try without these activities.

The Theory of Multiple Intelligences in Action

With the theory of multiple intelligences lending itself freely to educational settings, it makes sense that eventually certain schools would choose MI as a driving force in their curriculum. The intelligences are displayed in different ways at different developmental levels thus, instruction should emphasize opportunity during the elementary years (Gardner 1993). Several schools such as New City School in St. Louis Missouri have successfully adopted and MI-based curriculums.

At New City School, everyone is a learner and everyone is a teacher in one way or another. The faculty, staff, administration, and students are on a first name basis. They feel that this emphasizes individual people, not their jobs or status in the school (Faculty of the New City School, 1994). The students spend much of their time participating in learning activities that are not teacher directed. The teacher is instead a facilitator of the learning process, and not the ultimate authority on knowledge as is sometimes the case in a traditional classroom. The students and instructors learn together and develop a mutual respect and trust.

"We have found that multiple intelligences is more than a theory of intelligence; it is, for us, a philosophy about education with implications for how kids learn, how teachers should teach and how schools should operate,"(Faculty of the New City School, 3) says Thomas Hoerr, principal of New City School. What started out as an exercise in professional development lead to changes in the classroom. Once MI began to be implemented on a regular basis, the curriculum had to be modified. With this modification came a drastic change in assessment. The product of this educational revolution can be seen in every classroom at New City School.

The combined curriculum and teaching methods at New City School appear to be very different from those seen in traditional classrooms. However, if they are broken down into their individual components, one sees that they are not at all different from many techniques used in classrooms everywhere. The rationale is basically the same: children need authentic, exciting, hands-on activities in order to develop cognitive and affective skills in each subject area. Through the use of thematic units, simulations, and learning centers, the teachers at New City School are able to motivate students to cultivate strengths in many intelligences, while still teaching the basics of language arts, history, mathematics, and science.

Thematic teaching and the theory of Multiple Intelligences work together to create a new way of teaching in the elementary classrooms of the New City School . Thematic units revolve around content. The seven intelligences are able to serve as avenues of learning for that content so that each student learns according to his/her own needs and abilities. Because some students are likely to choose only activities that revolve around one intelligence, it is imperative to include opportunities for all of the intelligences to be explored together (Faculty of the New City School, 1994).

When developing thematic units at New City School, teachers Julie Stevens and Suzy

Schweig take steps to ensure that all of the students learning needs are met in the unit. When developing themes they make sure that the topics mesh with the philosophy of diversity that the school holds. Their unit, "Keepers of the Earth" revolves around Native American cultures. The unit is divided into components and the content of each is determined; in this case the components consist of different subcultures of Native Americans. The content is listed as key points or important facts to learn about each subculture.

Next, they develop activities that present the content in the form of the seven intelligences. Activities that concern the Lewis and Clark Journey in the Plains culture may include designing maps (spatial), estimating of exploratory expeditions (spatial and logical), and reading or discussing the journey from the viewpoint of Sacajawea (linguistic and interpersonal). By making sure that some of the activities overlap intelligences, students are provided the opportunity to see how intelligences can work together.

The children are then allowed to choose activities that they feel will help them to learn the content the most effectively. MI activities are used in several ways, either as a whole group activity, as independent choices, for assessment, or integrating skills into the theme. Independent choices may include writing letters describing the adventure (linguistic and intrapersonal), researching statistics of distances traveled to create and solve mathematical problems (linguistic and logical-mathematical), or walking around a track for several miles to get a sense of the hardships of the trip (bodily-kinesthetic and logical-mathematical).

Skills can also be integrated easily into a thematic unit. For this particular unit, the development of punctuation skills was incorporated into an exercise where the children had to

write a grammatically correct dialogue that reinforces a presentation to the class using Indian sign language (bodily-kinesthetic and interpersonal).

The children were able to learn skills through the medium of two of the seven intelligences.

Because of the multitude of ways in which the material is presented, assessment is often a concern for thematic units in general, (Campbell, 1994) let alone units that integrate the seven intelligences. But with some creativity and a focus on genuine understanding, authentic assessment can occur. Using various intelligences allows students a great opportunity to learn and to demonstrate this knowledge (Faculty of the New City School, 1994). It is important to assess the students through the lens of the seven intelligences, rather than with traditional multiple choice tests (Gardner, 1993). Because children should be tested over what they learned, in the general form that they learned it, assessment activities should mirror those which you have done in class, or apply the content in a similar model (Armstrong, 1994).

For the "Keepers of the Earth" unit, the students were asked to design a talking travel brochure for one of the major Lewis and Clark destinations. They were given real travel brochures, Lewis and Clark journals, and other references. The students presented their brochures to the class, who acted as "tourists" and asked questions while the teacher observed and assessed. In this form of assessment, the students were given the resources to integrate with the knowledge they had gained, and presented it in a way that used spatial, linguistic, and interpersonal intelligences.

Simulations are another way that MI can be incorporated effectively into the curriculum. They allow for meaningful learning to take place. "Using simulations, an environment is created that allows children to participate in and experience real life situations that are close to real life,"

say Carla Mash and Denise Willis, two fourth-grade teachers at New City School (Faculty of the New City School, 227)

In the upper elementary, role playing and simulation make up a large part of the curriculum. One fourth grade class spent six weeks at the beginning of each year not just studying pioneer life through history books, but actually living it through a simulation called The Oregon Trail. All of the subjects are incorporated into this role playing scenario. The students are placed on teams or trail wagons and they must work together to make it across the country.

All of the intelligences are used as avenues of learning during this exercise. They solve problems that are comparable to those that the pioneers did using the logical-mathematical intelligence, they have group meetings to divide up the work (interpersonal intelligence), and keep journals to reflect on their feelings throughout the journey (intrapersonal and linguistic intelligence). They might use their musical intelligence to compose songs about their journey, or develop their spatial abilities by constructing maps of the areas they have covered.

During all of this the teacher acts more as an observer than a giver of information. Carla Mash Duncan, a teacher at New City School, lead a workshop on simulations at the 1996 Multiple Intelligences Conference held in St. Louis. She said that she usually talks to the children for fifteen minutes of each hour and then allows them to work through the presented material. They are given evaluations that rate each other's work as well as their own progress. The students respond enthusiastically to the simulations, not only because they are fun, but because every child can use his or her individual combinations of intelligences to learn.

Bruce Campbell, a teacher Marysville, Washington has implemented multiple intelligences education in his classroom for several years. He notes some positive results of MI in the classroom in his 1994 book, The Multiple Intelligences Handbook: "Such breakthroughs include

identifying areas of strength, using strengths to overcome weaknesses, discovering a love of learning, and even scoring well on standardized tests" (166). Clearly, Campbell found the system of integration that suited his teaching style and used it to motivate students.

Bruce Campbell relies heavily on learning centers and intelligence based lessons as the focus for his instruction. Each center is designed to accommodate one of the seven intelligences. The lessons incorporate one or more of the intelligences with traditional curriculum. He outlines several models for instruction in The Multiple Intelligences Handbook (1994). Some of these include:

- **Seven learning centers each day:** Thematic and interdisciplinary curriculum is used in each of the seven centers. The students move from center to center in small groups while learning about the topic through each of the seven intelligences.

- **Three to five learning centers each day:** This model gives the teacher some flexibility in planning. Centers can be changed from day to day or week to week. It is similar to the one above, except that the personal intelligences are often incorporated into other centers.

- **Learning centers once weekly:** Five to seven learning centers are set up the same way as the above models, except that they are used once or twice a week to teach a special topic. It is very good for teachers who wish to experiment with MI before implementing a full-blown program in their classroom.

- **Whole class instruction in multiple ways:** This model is ideal for teachers who wish to keep their classroom traditional and their teaching direct. Techniques that feature different intelligences are included in regular instruction.

- **One intelligence is emphasized:** This is another whole class approach. One intelligence is highlighted each day. Over the course of seven days the curriculum will have covered each of the seven intelligences as a tool to learn the content. An eighth day may be added to allow students time to explore a particular intelligence of interest.

- **Self-directed learning— students' choice based upon individual strengths:** In this model, students can choose projects based on the intelligence of their choice. They use project contracts, time lines, conduct research, and determine how their learning will be demonstrated. This is a model in which the teacher serves as a facilitator. It can be used occasionally, or on a more regular basis. (6-7)

The students move from center to center in small groups that are of mixed ability. "For example," says Campbell during the workshop he held at the 1996 Multiple Intelligences Conference, "I try to include at least one student with strong artistic or musical skill in each group." The gender of the small groups is also mixed because they seem to stay on task more efficiently, produce more, and have fewer social problems (Campbell 1994). The groups stay together for time frames of about a month as they move from center to center.

Campbell has been implementing the seven learning centers in his own classroom for the last ten years. The students work at different centers in the morning to learn about the given topic. The afternoons are reserved for self-selected projects where they can demonstrate their learning skills in ways that incorporate several intelligences. Sharing and reflecting is an important part of the daily schedule. Students are able to see the ways in which others are using their intelligence, while thinking about their own intellectual progress.

An alternative to the thematic teaching in the implementation of multiple intelligences education is the use of individual lesson plans which focus on learning material through the lens of one or more intelligences. For example, students may be given the opportunity to learn about the metamorphosis of a caterpillar by reading a story (linguistic) and then creating a dance that exhibits the transformation (bodily-kinesthetic). The students learn the same material that they would under traditional circumstances (linguistic), but the activity is extended to develop the bodily-kinesthetic intelligence.

This method of integration is one of the easiest ways for traditional teachers to make the transition to multiple intelligences education. They are able to continue using the same curriculum, but may supplement it with multiple intelligences lessons when they feel it is necessary.

This is also a wonderful option for middle school and high school teachers who wish to implement MI, but cannot always fit lengthy projects or learning centers into their plans.

There is no "right" way to teach using MI. Neither the curriculum design of New City School, nor the learning center models of Bruce Campbell will suite every teacher, classroom environment, or student all of the time. What is important to remember is that the theory of Multiple Intelligences allows for flexibility. The teacher can incorporate its principles as much or as little as his or her schedule, teaching style, or curriculum allow. For more information about MI lessons and teaching methods see the resource section of this paper.

Assessment in the Multiple Intelligences Classroom

Assessment plays a critical role in education of any sort. Without it, progress cannot be determined, strengths from which to build cannot be identified, and mistakes cannot be rectified. In essence, assessment directs growth.

During the formative elementary school years, assessment is especially crucial because children are forming the building blocks of knowledge that they will use for the rest of their lives. Their habits, interests, social skills, and communication patterns are all developing. Assessment of activities in the classroom helps to determine the pace at which the students are growing academically, socially, and psychologically.

In a classroom where multiple intelligences education is being implemented, assessment is also necessary to determine the growth of the student in each of the areas of intelligence. However, it is unfair to teach to one set of criteria and assess using another. Thus, assessment in the MI classroom calls for a plan that goes beyond the traditional grading system.

Howard Gardner discusses his views on assessment in his 1995 article, *Reflections on Multiple Intelligences: Myths and Messages* (1995). Gardner is more concerned with how the assessment is carried out than the extent to which it is used with the implementation of multiple intelligences theory. He says, "Assessing multiple intelligences is not a high priority in every setting. But when it is necessary or advisable to assess an individual's intelligences, it is best to do so in a comfortable setting with materials (and cultural roles) that are familiar to that individual" (Gardner 1995).

Measurement of the intelligences is not as important as the appraisal of the individual student's growth in each area. That is, it is critical to examine how the child is developing, rather than how quickly or how much. With multiple intelligences education, quality is often more important than quantity.

The way in which the assessment is performed should directly correspond to the intelligence that he or she is using to learn material. For example, examining spatial intelligence should involve having the child explore an area to see if they can reliably find their way around it at a later time. In the case of musical intelligence, a student should be exposed to a new melody and then be asked to learn and apply it to a musical situation.

There are several ways in which assessment in an MI program can adopt an assessment plan that fits the needs of the course curriculum and methods of instruction. Among these are rubrics, student portfolios, and classroom museums. Each of these methods lends itself to different forms of MI instruction. They can be used in collaboration with one another, or individually, depending on the needs of the curriculum, students, and teacher. All share the common goal of authentically assessing student work.

Genuine Understanding as a Goal for Assessment

Before discussing each method of assessment, it is critical to define the goal of multiple intelligences education in reference to learning. The term "genuine understanding," or GU, has been developed by Howard Gardner and his colleagues at Harvard Project Zero (Faculty of New City School 1994) . GU is a model for assessment in the classroom. According to Gardner in The Unschooled Mind (1991), genuine understanding occurs when students are able to take information and skills that they have learned in school or other settings and apply them flexibly and appropriately in a new or unanticipated setting. At New City School, GU involves "using skills or information in a new and novel way." (Faculty of New City School, 1994, 234)

Rubrics, student portfolios, and student created museums in a multiple intelligences classroom all lend themselves quite easily to the principle of genuine understanding. All of these correspond to curriculum that is designed to foster GU. The curriculum of an MI classroom is constructed so that the students must define problems, choose appropriate methods to solve them, and then demonstrate that understanding has occurred. This process is then assessed using the above tools so that the teacher, parent, and student is able to see an accurate reflection of the student's progress and ability.

Rubrics

The rubric is the most structured of the forms of assessment listed above. It contains a marked set of criteria to which the student's work must adhere. It sets the standards for what dictates the best, mediocre, or an unacceptable outcome in a learning situation. The student is made aware of these criteria at the onset of learning because part of the students' education is understanding the standards by which they are being measured (Faculty of the New City School, 1994).

New City School has recently adopted a rubric system in place of the traditional grade card. Their rubric system does not use letter grades. Instead, abbreviations that describe the child's behavior in different areas of the learning process are designated. The students are evaluated according to academic, personal, and social development in each of the seven intelligences.

In the book Celebrating Multiple Intelligences: Teaching for Success (1994), written by the staff of New City School, a sample of the rubric used to assess the personal intelligences is given. The topics listed on the sample rubric for the intrapersonal intelligence, include confidence, motivation, problem solving, responsibility, effort and work habits. In the area of problem solving a student might receive an "ED" (Exceeding Developmental Expectations), or they may have "AC" (Area of Concern) marked in the motivation section. Each section of the rubric sets a behavioral and demonstrative standard that the student is measured against.

An MI profile is also used to complement the rubric system. In this profile each of the seven intelligences are assessed according to teacher-observed behaviors exhibited by the child during the term. Specific examples of learning can be cited in the "appreciate", "performs", or "creates" section of the profile. The profile also notes areas of limited interest and activities in different intelligences that the student consistently makes. This profile is designed to communicate to the parents the way in which the student functioned in the classroom during the set term.

Student Portfolios

Student-based portfolios are another way in which students in MI-based classrooms can be assessed. Portfolios consist of "a purposeful collection of student work that shows growth,

strengths and turning points, and may utilize a variety of material" (Faculty of the New City School, 1994, 240). According to Bruce Campbell, a teacher who has successfully used portfolios in his MI classroom, portfolios should contain a combination of teacher-chosen work and student-chosen work (Campbell, 1996). This ensures that students and teachers will work together to construct an unbiased portfolio that accurately demonstrates the student's progress, strengths, and areas of possible improvement.

Portfolios in an MI-driven classroom differ from those that might be seen in a traditional classroom in that the portfolio contents of a more traditional classroom are often limited to work that demonstrates only linguistic and logical-mathematical intelligences. In the case of classrooms where MI theory is in practice, portfolios should be expanded to include materials from all seven intelligences (Armstrong, 1994). Media such as video recordings, audio recordings, art projects, journal entries, and recorded student dialog that demonstrate growth in the intelligences are all appropriate to use in an MI portfolio in addition to written work.

Once the portfolios are compiled, assessment must take place. The teacher must decide the way in which the portfolio will be judged. Thomas Armstrong, author of Multiple Intelligences in the Classroom (1994), suggests that MI assessment of portfolios should focus on individual students' work *in depth* in order to define each student's uniqueness. This relates back to the anti-bias model for multicultural education in that establishing a personal identity, or uniqueness, is imperative for the appreciation of oneself and of others.

The focus of portfolio assessment should be on student self-evaluation rather than a comparison with other students in the class. Because no two students are identical, their work will not be identical. In an MI-driven classroom, where the students may be participating in different types of projects based on combinations of intelligences, it is unfair to compare student work as a

means of assessment. Rather, the students should note improvements or deficiencies in their own work that have occurred over a period of time (Armstrong 1994). They will then be able to see the progress that they have made and challenge themselves to improve areas at their own pace.

Student-created Museums

Student-created museums are probably the form of MI assessment that correspond most directly with the principle of genuine understanding and the theory of multiple intelligences itself. Creating museums allows students to apply the knowledge they have learned in a practical form, which is not directly associated with the context in which they learned it. The planning, building, and exhibition of these student-created museums allow the children to demonstrate their understanding of the material in a way that is culturally appropriate. The theory of multiple intelligences holds that an intelligence requires the ability to solve problems or produce goods that are of value in a particular cultural setting or community (Gardner, 1993). Because these museums are a product designed for interaction with the community, they fit this definition.

A museum is more than a display of students' work. It is an interactive learning situation in which the children are the teachers. Through the exhibits the students are able to communicate the different ways in which they have learned about the subject at hand. They are the planners, the builders, the docents, and the critics of the museum.

Christine Wallach, a first grade teacher at New City School, uses student-centered museums to demonstrate genuine understanding of the material that she teaches. She details this process in the book Celebrating Intelligences: Teaching for Success (1994), which she and her colleagues at New City School coauthored. After studying a thematic unit on plants she and three other first grade teachers decided that a plant museum, designed by the students would be an

appropriate way to assess what the children had learned in a meaningful context. They followed a set process that allowed them to guide the students through the creation of the museum.

First, they had the children brainstorm and list all of the museums in the St. Louis area that they were familiar with. In small groups, the children listed positive attributes of each museum. The students shared these lists with other groups and decided upon qualities that they agreed made a museum enjoyable.

In the next step, the children were divided into three groups to visit three of the most popular museums. They used rating sheets to evaluate the museums in the areas of aesthetic appearance, interactions available, and performance level. After reviewing the rating sheets the students discovered that the museums with the highest rating were those that allowed the visitor to interact and participate with the exhibits.

This information, along with the criteria that the students had set for a "good museum" was used by the children to generate ideas about how they could share the information they had learned about plants in their own museum while incorporating the seven intelligences. The teachers served as recorders of the ideas while the children discussed their plans. "Shivers ran up our spines as we realized that they were already taking ownership of this museum," says Wallach (238).

All of the intelligences were used by the children in the design and preparation of the exhibits. It was also decided by the students that the exhibits themselves would allow the visitor to use the seven intelligences to explore the museum. Some examples of the exhibits in the plant museum include:

- A maze that a visitor could walk through while learning facts about the desert (bodily-kinesthetic)

- The creation of a visitor page that asked the question "If I were a plant I would be..." (linguistic and intrapersonal)
- Giant puzzles that depicted farming in different areas of the world (logical-mathematical_
- Model foldouts that demonstrated how seeds are created (spatial)
- Videotaped dances and musical presentations describing plants and their habitats (musical and bodily-kinesthetic)
- Student guided tours of the museum where visitors could engage in conversation (interpersonal)

The children applied for jobs in the museum and invited parents, schoolmates, and community members to tour the plant museum they had created. The ownership of the museum made the students take responsibility for the way it was operated. They scheduled tours, gathered supplies, and even managed a student-created gift shop.

In assessing the museum, ongoing evaluation was used by both the students and the teachers. Ratings sheets, questionnaires, and discussion allowed the students to reflect on their work, make needed changes, and evaluate the outcome. The students were also asked to evaluate how they worked with others during the planning, building, and operating process. The ratings were recorded by the teachers and used to assess student growth.

Each of the methods of assessment that have been discussed are fair and demonstrate genuine understanding. They allow the student to set goals for themselves, reflect upon personal and academic growth during the learning process, and have input into their evaluation. By giving students choices about how they will learn and how they will be assessed, educators in these MI classrooms are putting the responsibility of learning where it should be, on the student.

Conclusion

Howard Gardner's theory of multiple intelligences, if wisely implemented into the elementary classroom, can unlock the natural genius of many children. By showing students that they can be smart in several different ways, MI teachers are giving them the freedom to choose their academic path of self-discovery. In contrast to the traditional classroom where the focus is on the linguistic and logical-mathematical intelligences, the MI classroom places value on all forms of intelligence. Some children identified as at risk in a traditional classroom might be considered gifted in a different context, such as the one provided by learning through seven different intelligences (Krechevsky 1991) . MI allows every child to succeed.

Because every culture demonstrates the intelligences in different ways, the theory of multiple intelligences supports the anti-bias model of multicultural education. Students learn how their identity has been shaped by their culture, personal experiences, and intelligences. This sense of identity not only builds self esteem, but also allows them to appreciate the differences and similarities in all people. This leads to a greater appreciation and acceptance of all diversities, which is the ultimate goal in a multicultural classroom.

Teachers wishing to make the transition from a traditional classroom to a multiple intelligences classroom have several options. They can choose to use thematic units, learning centers, or individual lessons that explore the curriculum using one or more of the seven intelligences. Planning, flexibility, and reflections are essential to this teaching process. The teacher must ultimately choose the plan of implementation that best fits his or her teaching style.

Assessment of the material taught in a multiple intelligences classroom must be fair and authentic. The child and the teacher need to engage in meaningful reflection and evaluation for academic growth to occur. Rubrics, student portfolios, and student-created museums all

demonstrate that genuine understanding has developed.

Is the theory of multiple intelligences the answer to all of the problems facing our educational system today? Of course not. There is not one theory, method of instruction, or curriculum that will fit every situation. However, multiple intelligences education does allow for every child to find success and cultural value in his or her work. It builds confidence, self-esteem, and personal identity. Because it is child-centered, it also allows students to actively participate in their education.

Through the research for this project I have read about the success that MI can lead to in the classroom, I have seen a school where the children excel because their individual talents are recognized, and I have witnessed the changes in my own students when the theory of multiple intelligences is put into action. Do I believe in MI-driven education? YES! I have found it to be one of the best educational theories in practice today. It supports my educational philosophy that every child can learn and even excel, when their hidden talents are revealed. This I feel, is education at its finest. As Howard Gardner stated in his keynote address at the Multiple Intelligences Conference in St. Louis, "For years, education has been seeking to determine how smart children are. The theory of multiple intelligences tries to determine how they are smart."

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Teachers' Resources

These books contain more information about the ways in which MI theory can be implemented into the classroom, as well as activities and lessons which focus on the intelligences:

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